

VILLAGE ON THE BANKS OF THE CHAGRES RIVER

THE PANAMA CANAL

BY WM. E. W. YERBY

CULEBRA CUT — SHOWING GOLD HILL

WHEN one looks upon the gigantic work that is in progress on the isthmus of Panama and beholds the hills and the mountains giving way before the onward march of modern machinery—sees steam, electricity, air and water all harnessed and made to do the bidding of man, he can but stand in awe and ask the question: What is the propelling power back of this great undertaking?

And the question comes to him in redoubled force as he remembers that the spot on which all this great work is in progress was only recently regarded as the death-hole of the world—but now, when he beholds a land freed from the fearful ravages of the diseases that had for centuries taken their toll of human life by the tens of thousands, he is constrained to ask again: What has wrought this wonderful change?

And the answer comes back to him from far down the rugged road that is filled with the fumes of the midnight oil that has been burned by students and men of science of past and present times: O, fellow-toiler, over and above and around and directing this great enterprise, upon which the eyes of the world are centered today, is the freestillable power of well-trained, cultured intellect.

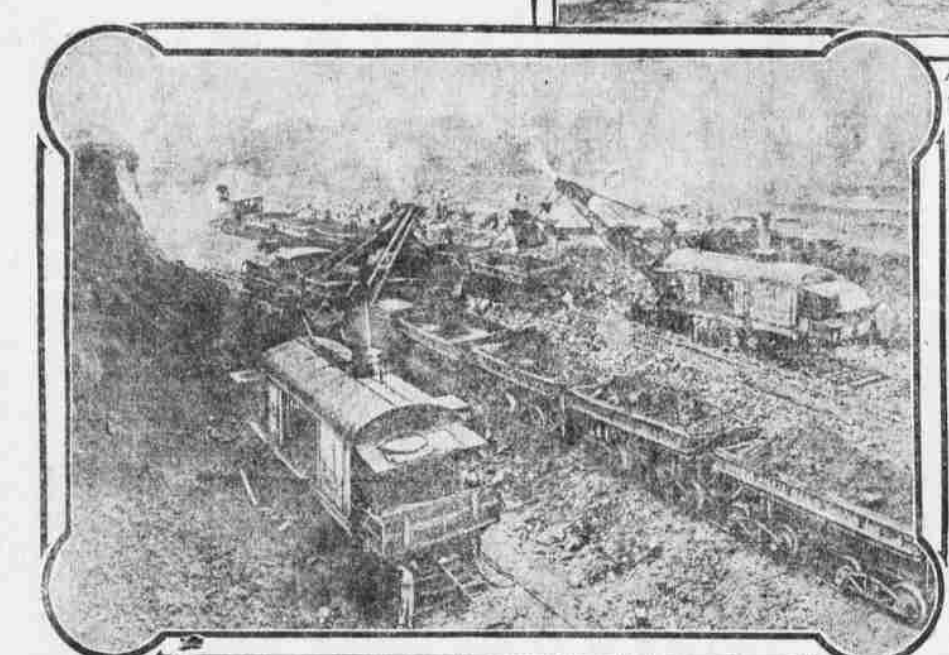
It is remarkable the number of people one finds who are of the opinion that the idea of a canal across the isthmus of Panama is something of recent origin, when the fact is, it is



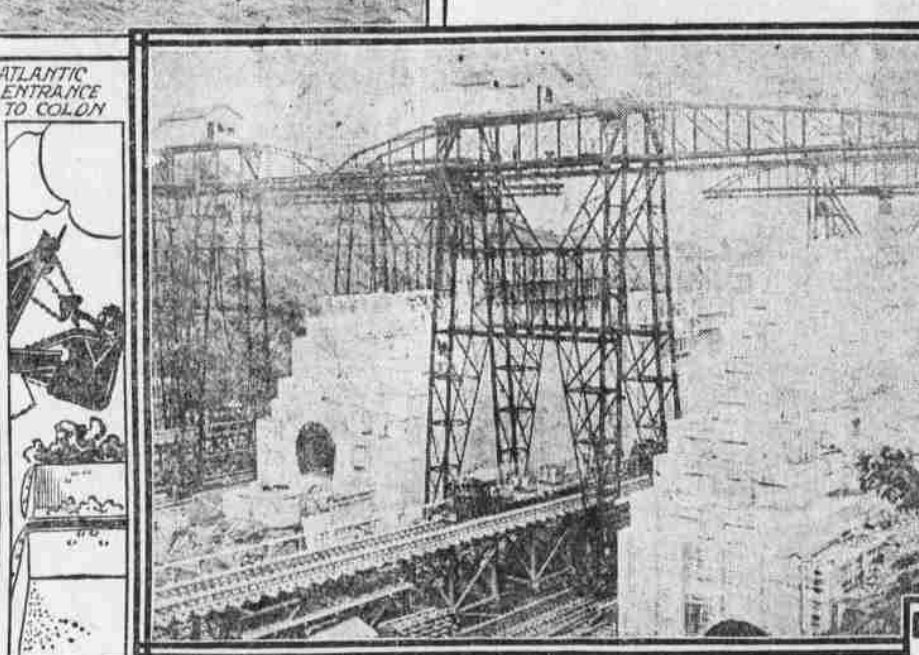
have covered the sides of the excavation with solid gold. The cut through these mountains is known as Culebra cut, and is nine miles in length—through solid rock. The cut begins at Bas Obispo and ends at Pedro Miguel locks.

The question is often asked, What becomes of the vast quantities of dirt, rock, etc., that are taken from the canal? It is loaded on trains by means of the steam shovels and hauled off—a portion being placed on Gatun dam, a portion is taken to the Atlantic and a portion to the Pacific oceans and placed on the great breakwaters that are building there, and yet other trains are busily engaged in hauling the excavations to the railroad tracks that will skirt the northern edge of the canal, and which will have a solid rock bed the entire distance. They find use for every particle of it. Getting rid of these excavations has caused the Canal Zone to become the busiest railroad center in the world. It is said that 900 trains pass a given point near the town of Culebra in a day, hauling out the rock from the cut.

The United States is constructing a lock canal, as before stated. These locks are in pairs, each having a width of 110 feet and a length of 1,000 feet. Each lock consists of a chamber, with walls of concrete, and with water-tight gates at the ends. The level of water is to be regulated through openings in the bottom by the operation of valves in the side and center walls, which will permit the water to flow into and out of the locks by gravity. It is estimated that it will require eight minutes to fill one of them. The locks are the largest that have ever been designed in the history of the world. The gates con-



HAULING OFF EXCAVATIONS FROM CULEBRA CUT



PEDRO MIGUEL LOCKS

a matter that has engaged the attention of the civilized world for nearly five hundred years. Many unsuccessful attempts have been made to accomplish the object in the past, and it is good to realize that the dreams and designs of the Spanish adventurers of the fifteenth century are about to be brought to pass by American engineers of the twentieth century. Spain, Portugal, England and France have each in turn made a failure in their attempts to pierce the isthmus with a canal.

Columbus was the first to propose a water highway from Europe to Asia, westward, by way of the Atlantic. It was such a highway he sought, and not the new world, which he really found. He landed on the isthmus of Panama, near the present site of Colon, in the year 1502, but it was a Spanish engineer named Saavedra, one of Balboa's followers, who first advocated the construction of a canal across Panama. This was in 1517, and after studying the question for a dozen years, he submitted his plans to Charles V., king of Spain. Surveys of the isthmus were made, but the work of cutting a canal was reported to be impracticable. After the death of Charles V., his successor, Philip II., in 1597, sent an engineer to survey the Nicaraguan route, who likewise made an adverse report. The question was then abandoned for 200 years, after which time it was again opened, and has been before the public ever since.

In the year 1880 the French people, headed by Count Ferdinand de Lesseps, who had gained both fame and fortune by the successful completion of the Suez canal, took up the matter of constructing the Panama canal, and went vigorously to work to connect the two oceans. The great engineer thought he had really an easier undertaking before him than he had recently been successful in accomplishing—that is, the cutting of the Suez canal—but he was vastly mistaken. As work progressed on the canal with seeming success, glowing reports were waited back to France of what was being done, and the fame of de Lesseps rose to the point of hero worship. In 1884 he was elected to the French academy, and was saluted by Gambetta, as "the Grand Old Frenchman." In 1885 he was seated among the Immortals—Victor Hugo, the great French novelist, being his sponsor, and Renan, that other brilliant French writer, delivered the valedictory.

But the dark clouds were gathering behind all this fantastic show, and in a few more years the crisis came. The expenditure of money that had been contributed mostly by the poorer people of France was something awful—the amount being placed as high as \$800,000,000 in eight years; and then the crash came, burying beneath the wreck the hopes

and expectations of the great engineer, and carrying sorrow and want to the homes of thousands upon thousands of French people who had contributed their little all toward forwarding the great enterprise. The nation was brought to the very verge of revolution. Judicial proceedings were instituted, and trials were had, extending over a period of five years. There was disclosed to the horrified world such an orgy of corruption as history had never before recorded. A hundred French senators and deputies were accused of having taken bribes, and the police department was under the same charge.

Count de Lesseps never recovered from the shock—and went down to his grave in 1894—only 16 years ago—a broken-hearted old man—but his fame will remain immortal despite the sad ending of his career.

In 1903 the United States purchased the interests and belongings of the French company on the isthmus of Panama, paying therefor the sum of \$40,000,000—the assets consisting of valuable surveys, implements of all kinds, many thousand houses, railroads, land; and also paid the Republic of Panama \$10,000,000 for the Canal Zone—a strip of land in said Republic of Panama ten miles wide and practically 50 miles long—extending from Colon on the Atlantic side to Panama City on the Pacific. Through the center of this ten-mile strip the canal is being constructed. At present there is an army of nearly 40,000 men engaged in the gigantic undertaking of building this great water highway from ocean to ocean.

The first party of Americans went to Panama in 1904 to begin work, but they found the country infested with diseases of the most fatal kinds, and the year 1904 was practically spent in improving health conditions. This work has been under the supervision of Col. W. C. Gorgas, and so effective have been the methods pursued by him and his able assistants in the Canal Zone of the isthmus of Panama that the health conditions of that tropical country are about as good today as those of the southern states of America.

Contrary to the general belief, the United States is not digging a "big ditch" across the isthmus of Panama. When the canal is finished and ships are steaming across Panama from the Atlantic to the Pacific, or vice versa, the waters of the two oceans will still be at least forty miles apart. They will never meet at all. A sea-level canal, which would have allowed the waters of the Atlantic and the Pacific to come together, is not being dug; but an 85-foot lock canal is being constructed. As to the relative merits of the sea-level and the lock canal it is not within the province of this article to discuss.

The 85-foot lock canal which is being constructed consists of a sea-level entrance channel 7 miles long, 500 feet wide and 41 feet deep on the Atlantic side to the foot of Gatun (pronounced "Gatoun") locks. On the Pacific side there is a corresponding sea-level channel to Miraflores locks, about 8 miles long, 500 feet wide and 45 feet deep.

At Gatun the 85-foot lake level is obtained by a great dam about a mile and a half long, and nearly half a mile thick at the bottom or base. The dam rests on impermeable material of sufficient supporting power, and fills the openings between the hills at Gatun, through which the Chagres (pronounced "Shagers") river flows to the sea. This river crosses the channel of the canal no less than fifteen times in its serpentine course and is one of the most turbulent streams known during high water, though it looks peaceful enough during the dry season. It was one of the great obstructions to the possibility of digging a sea-level canal, but this enemy has been converted into a friend, and will be made to supply the greater portion of the water for filling the great artificial lake.

The great Gatun dam—upon the successful completion of which depends the success of the canal—consists of a water-tight center core composed of clay and sand mixed in proper proportions. These materials were adopted after consultation with the best experts in the world, who came to the conclusion that clay and sand were the most impervious materials that could be used. This material, after being properly mixed, is deposited hydraulically—that is, by being pumped in by dredges. This center core is confined by a rock wall on each side, the rock so used being taken from Culebra cut. At the bottom this impermeable core of clay and sand has a width of about 800 feet, and gradually tapers upward until a minimum thickness of 400 feet will be had at the water level of the lake. The dam will rise to a height of 115 feet, or a distance of 30 feet above the level of the lake. The artificial lake—which will be known as Lake Gatun—will cover an area of 164 square miles, or over 100,000 acres. The entire navy of the United States can find safe anchorage therein.

The greatest obstacle that has stood in the way of the engineers for the past 500 years in constructing a canal across Panama has been the mountain range known as the Cordilleras—the backbone of the continent. It was here that the French people wasted and squandered such a great amount of money that the picture shown above is called "Gold Hill"—it being asserted that they spent enough in their endeavor to cut through the mountain at this point that the money used would

cost of two leaves and are massive steel structures 7 feet thick, 65 feet long and from 47 to 82 feet high. Eighty-four leaves will be required for the entire canal, and their total weight will be 86,000,000 pounds, and will cost nearly \$6,000,000.

When the canal is completed—which Colonel George W. Goethals, who is in charge of the great work, says will be some time during the year 1915—here is the manner in which a vessel from the Atlantic side will get to the Pacific: It will enter the sea-level channel at Colon and go a distance of seven miles to the foot of Gatun locks; there it will be lifted by means of these locks a height of 85 feet above the sea level to the surface of Gatun lake; the gates of the lock will be opened and it will steam out on this lake and go a distance of 23 miles to the beginning of the great Culebra cut, and carefully proceeding through this cut a distance of nine miles, it will enter the lock and be lowered a distance of 23.13 feet to the level of Miraflores lake, and then it will steam a distance of three miles across this lake to Miraflores locks, where it will be lowered by two flights a distance of 56.23 feet to sea level, and then it will enter the Pacific channel of the canal and go a distance of eight miles out to deep water of the ocean. It will require from ten to twelve hours for a vessel to make the passage from one ocean to the other—thus saving many thousands of miles of travel, and many days of time in a journey to any of the ports on the Pacific side of the Americas and also to the Orient.

Colonel Goethals states most positively that the cost of the canal will not be over \$375,000,000; and in this amount is included the purchase of the French company's belongings—\$40,000,000—and the \$10,000,000 paid for the Canal Zone, and also the cost of the sanitary department, which of course has been a considerable amount.

In order to get some idea of what the cost of the canal means—\$375,000,000—and put it so the mind can in some measure grasp the figures, we make the following statement: There are in the world nine principal canals, to wit: The Suez, the Kiel, the Manchester, the United States Ste. Marie, the Canadian Ste. Marie, the Amsterdam, Corinth, Cronstadt and the Erie-Ontario canal. The total cost of all nine of these canals was \$264,000,000, which is less by \$111,000,000 than the Panama canal alone will cost at the lowest estimate. But even if this amount is doubled the United States will complete it. The pride and reputation of the nation are at stake, and she cannot afford to make a failure as all the other countries have done that have gone before.

CONGRESS

Speaker Cannon Saturday afternoon made the unique ruling that in so far as the national house of representatives is concerned, today is yesterday. In other words, he sustained the contention that Friday's session was still in progress.

Immediately after this announcement Representative Mann of Illinois, who filibustered all day Friday against the passage of the omnibus war claims bill, resumed his tactics and began to demand roll calls on every proposition put before the house.

Routing of Daily Proceedings.
The chief feature of the senate session Monday was a speech by Senator Bailey in support of Mr. Lorimer. When adjournment for the day was taken announcement was made that Mr. Bailey would continue Tuesday. Senator Curtis preceded Senator Bailey, speaking against the resolution for the election of senators by direct vote of the people.

The Lorimer case and the popular election of senators divided the day in the senate Tuesday, although time was found for other business as well. Senator Bailey concluded his speech in defense of Lorimer. Then an effort to fix a day for a vote on the resolution for the Illinoisan's removal failed. Senator Norris Brown spoke in advocacy of the election of senators by direct vote of the people. A bill was passed providing for a children's bureau in the department of commerce and labor.

The McCall bill providing for reciprocity between the United States and Canada was passed at a night session of the house by a vote of 221 to 92. Debate on the measure consumed the entire day. Among those who spoke at length for the measure were Underwood of Alabama and Clark of Missouri, while its chief opponents were Dalzell of Pennsylvania and Fordney of Michigan.

The conservation bill providing for the purchase of forest reserves in the eastern states was passed in the senate Wednesday by a vote of 57 to 9. Several speeches were made before the vote by Senators Brandegee, Newlands and Simmons for, and Burton and Heyburn against the measure. The McCall bill, carrying the Canadian reciprocity agreement, was received and referred to committee. The Lorimer case came up again. Senator Beveridge failing to obtain unanimous consent for a vote on it next Tuesday.

Practically the entire day in the house was devoted to consideration of the Moon bill for codification of the judiciary laws. It was so amended as to increase the salaries of the justices of the supreme court of the United States.

The resolution looking to a constitutional amendment to provide for election of members of the United States senate by direct vote of the people occupied most of the time of that body Thursday. But one set speech upon the subject was made, however, that being by Senator Borah in its advocacy. Senator Heyburn made a speech of protest against a news article in a local paper, which asserted that the president held the "whip hand" over the senate and might force a vote on the Canadian trade agreement by a threat of an extra session of congress. Mr. Heyburn thought the dignity of the senate had been assailed.

In the house the day was given to consideration of the legislative, executive and judicial, the army and the naval appropriation bills, general debate on the last carrying the house far into the night.

Election of United States senators by direct vote of the people was under consideration throughout Friday's session of the senate. Speeches were made by Senators Rayner, Carter and Heyburn, the first opposing and the others favoring the Sutherland amendment to the resolution. This amendment provides for congressional control of senatorial elections in the states.

The house had a filibuster on its hands, determined opposition appearing to the omnibus claims bill being taken up. That body held a night session.

Initiative Passes in California.
Sacramento, California.—Senator Gates' resolution for the submission to the people of a constitutional amendment providing for the initiative and referendum passed the assembly by unanimous vote.

Kills Brother in Fight.
Webb City, Mo.—The Stidham killed his brother William here in a fight with a knife and gun over a woman.

14,618,761 Are Catholics.
Milwaukee, Wis.—The Roman Catholics in the United States, according to the Wiltz official directory for 1911, number 14,618,761. This does not include the Philippines, Porto Rico or the Hawaiian Islands.

Walsh Pardon Is Considered.
Washington, D. C.—Attorney General Wickersham is working on John R. Walsh's application for pardon and probably will be ready to send his recommendations to President Taft within the next few days.

Naval Officer Kills Himself.
Newport, R. I.—From authoritative sources it is learned that the death of Commander Frank Marble, United States navy, of the Naval War college staff, was due to suicide and not to apoplexy.

Cremated in Coffin He Made.
Cincinnati, O.—In a casket made of cherry wood that had been hewn by himself more than 50 years ago, the body of William N. Whiteley, millionaire manufacturer of reapers, of Springfield, O., was cremated here.

OTTUMWA WOMAN CURED

By Lydia E. Pinkham's Vegetable Compound

Ottumwa, Iowa.—"For years I was almost a constant sufferer from female trouble in all its dreadful forms: shooting pains all over my body, sick headache, spinal weakness, dizziness, depression, and everything that was horrid. I tried many doctors in different parts of the United States, but Lydia E. Pinkham's Vegetable Compound has done more for me than all the doctors. I feel it my duty to tell you these facts. My heart is full of gratitude to you for my cure."—Mrs. HARRIET E. WAMPLER, 624 S. Ransom Street, Ottumwa, Iowa.

Consider This Advice.
No woman should submit to a surgical operation, which may mean death, until she has given Lydia E. Pinkham's Vegetable Compound a fair trial.

This famous medicine, made only from roots and herbs, has for thirty years proved to be the most valuable tonic and invigorator of the female organism. Women residing in almost every city and town in the United States bear willing testimony to the wonderful virtue of Lydia E. Pinkham's Vegetable Compound.

Mrs. Pinkham, at Lynn, Mass., invites all sick women to write her for advice. Her advice is free, confidential, and always helpful.

COMING EVENT



He—Do you think your father would offer me personal violence if I were to ask him for you?
She—I think he will if you don't pretty soon!

Probably Got Off.
Apropos of certain unfounded charges of drunkenness among the naval cadets at Annapolis, Admiral Dewey, at a dinner in Washington, told a story about a young sailor.

"The sailor, after a long voyage," he said, "went ashore in the tropics, and, it being a hot day, he drank, in certain tropical bars, too much beer. As the sailor lurched under his heavy load along a palm-bordered avenue, his captain hailed him indignantly.

"Look here, the captain said, 'suppose you were my commander, and you met me in such a condition as you're in now, what would you do to me?'

"Why, sir," said the sailor, 'I would not condescend to take no notice of you at all, sir!'

A Dry Wash.
Representative Livingston of Georgia, who disgusted at the bath-tub debate in the house recently, proposed that a little money might be made by renting the bath tubs out, said recently, apropos of this subject:

"We are now a good deal like Bill Spriggins on a zero morning.

"Bill's valet entered his bedroom one January morning and said with a shiver:

"Will you take your bath hot or cold, sir?"

"Thank you," said Bill, 'I'll take it for granted!'

Scott's Rebecca in 'Ivanhoe.'
The character of Rebecca, in Scott's "Ivanhoe," was taken from a beautiful Jewess, Miss Rebecca Gratz of Philadelphia. Her steadfastness to Judaism, when related by Washington Irving to Scott, won his admiration and caused the creation of one of his finest characters.

True pleasure consists in clear thoughts, sedate affections, sweet reflections; a mind even and stayed, and true to itself.—Hopkins.

Women Appreciate

Step-savers and Time-savers.

Post Toasties

is fully cooked, ready to serve direct from the package with cream or milk, and is a deliciously good part of any meal.

A trial package usually establishes it as a favorite breakfast cereal.

"The Memory Lingers"

POSTUM CEREAL CO., Ltd., Battle Creek, Mich.

Religion of Gwari Pagans

These People Appear to Live in Dread of the Spirits of Their Ancestors.

It is always a matter of great difficulty to get any really satisfactory idea of the religion of pagan tribes. During a stay of some three years amongst the Gwari, however, I was able to form some notion of what was at the back of their minds. They

have an idea of a supreme being, but do not worship him any way that I have been able to discover. Probably this idea is just their paganized conception of the Mohammedan Allah. Their actual worship is more closely connected with the spirits of their ancestors. They appear to live in dread lest these spirits should work damage to their farms, and with this in view they are careful to supply them

at frequent intervals with food and drink, which are deposited near their graves. These tombs are, in the case of chiefs, in the royal compound, and huts are built over them, wonderfully decorated with light colors. In other cases the graves may be dug in some lonely place, away from the houses of the living, and often in the depths of the forest. A spirit house which I have often visited is in a woodland glade within half a mile of my compound, and belongs to the family of the chief butcher of Kuta. Owing to

its proximity to my abode it has fallen into disuse, as the pagans become somewhat chary of performing their mysterious rites so near the white man.

Some departed spirits are supposed to inhabit the large trees which are to be found in almost every pagan town, and small earthenware pots containing food may be seen surrounding these trees.

It is not often that one can see the Gwari at their religious exercises; but a few months ago, on entering a

Gwari village, I saw a man kneeling in front of one of these small spirit huts with a pot of some drink in his hand, apparently expostulating with the spirit—possibly because it had treated him badly—and occasionally pouring some of the contents of the pot upon the outside wall of the hut—Wide World Magazine.

Value of Borax in Milk.
A pinch of borax stirred into fresh milk will keep it for some time, and also prevent the cream turning sour.